SIMON GAMBLE

37 – 39 CHESSWOOD ROAD, WORTHING

SURFACE WATER DRAINAGE STRATEGY

August 2010

1 BACKGROUND

1.1 The scheme is intended to provide surface water drainage to the proposed scheme at 37 – 39 Chesswood Road, Worthing. This scheme includes the demolition of the existing pair of semi-detached houses, their replacement with a block of flats on the same footprint and the construction of a terrace of four houses to the rear of the site. An outline of the proposed scheme is shown on the attached Proposed Surface Water Drainage Layout drawing.

1.2 The existing site is generally level with the part behind the existing houses used as a domestic garden. Surface water from the existing houses drains to a Southern Water surface water sewer running along Chesswood Road with the paving in the front gardens draining informally. The layout of the Southern Water surface water sewer is shown on the drawings in Appendix A.

1.3 Percolation tests have been carried out at the site indicating that drainage by infiltration is practical. It is therefore intended that drainage to the new houses and to the new areas of hardstanding shall be to soakaway while the drainage from the flats shall continue to the surface water drain. There will therefore be no increase in surface water runoff from the site as a result of the proposed development up to the 1 in 100 year rainfall event.

2 SOAKAWAY DESIGN

2.1 We understand that the construction preference is for a shallow soakaway system.

2.2 Owing to the lack of fall on the site, the drainage system is divided into two areas with the front and rear of the site draining separately.

2.3 The areas to be drained taken from the layout drawings are:

Hardcover Areas	**m2**
Houses	212
North parking	422
Car ports	85
Access to rear	127
Flats	170
Forecourt	169
	104
Total area	1289
Area rear	719
Area front	570
Front - excluding flats	400

2.4 The system is designed to accommodate the 1 in 10 year event with factors of safety and the 1 in 100 year event without a specific factor of safety but including an allowance for climate change. The soakaway is required to have sufficient capacity under both these conditions with a time of half-emptying less than 24hrs.

2.5 It is proposed to provide the required storage and infiltration using Wavin Aquacell Core units installed in a single layer in accordance with the manufacturers instructions. The units will be positioned below paved areas so the depth of the units below the surfacing will be as recommended by the manufacturer for the traffic envisaged but is unlikely to be less than 750mm to the upper surface of the units.

2.6 The areas of the units required are assessed in Appendix B with the shape and position proposed on the attached Proposed Surface Water Drainage Layout drawing. The positions and shape may be amended to suite final layouts.

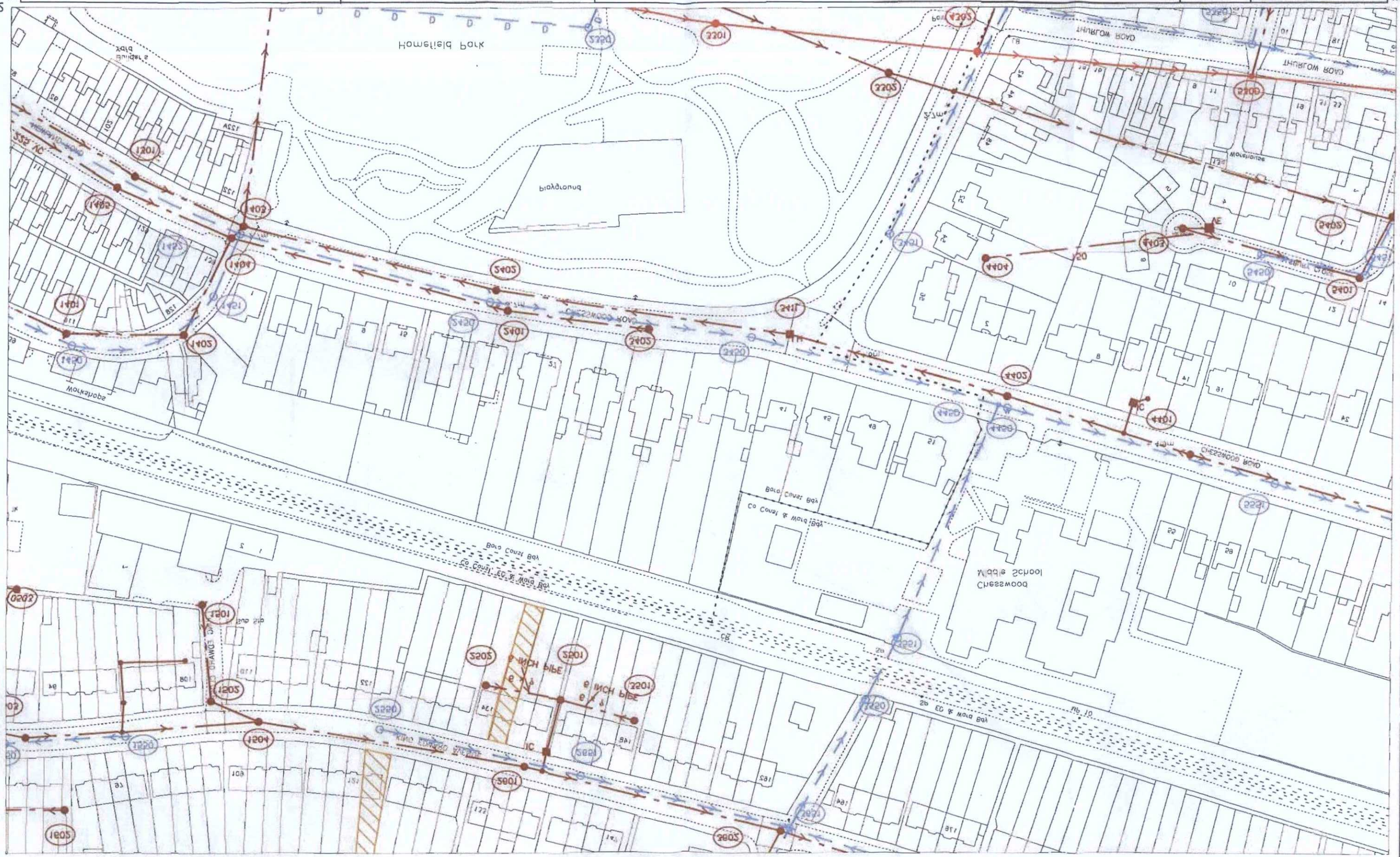
2.7 The infiltration rate has been tested on site and established at 2.066E-6 m/s.

2.8 Inflow into the Aquacell units shall be protected from contamination by petrol interceptors.

2.9 The layout drawing also shows suggested gully positions and pipe runs. The gullies shall be positioned to suite the falls in the surfacing and pipe runs to be amended to suite gully, roof drainage and other item positions.

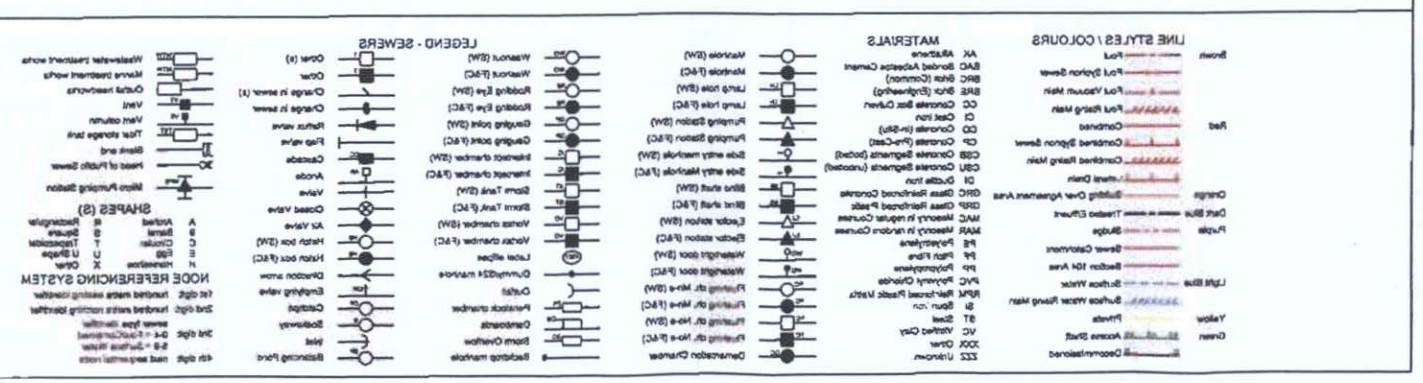
APPENDIX A

Title: 100788 37-39 Chesswood Road	Date: 19\02\2020	Licence No. WU 288230. Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved	N
TQ72033W O.S. REF.	Scale: 1:1250	WARNING: Unknown (UNK) materials may include bonded Asbestos Cement WARNING: BAC pipes are constructed of bonded Asbestos Cement The actual positions should be determined on site. In the event of inaccuracy. The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility	
	Drawn by: gosmarm		Southern Water


Homefield Park
Playground
Chesswood Road
Bolo Canal Bdy
Co Canal & Moto Bdy
Middle School
Chesswood
THURLOW ROAD
Montpelier
Bolo Canal Bdy
Co Canal & Moto Bdy
Chesswood Road
Co Canal & Moto Bdy
Bolo Canal Bdy
Co Canal & Moto Bdy
Montpelier
Chesswood Road
8 INCH PIPE
8 INCH PIPE
Land Slip
Land Slip
Land Slip

SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape		Node	Cover	Invert	Size	Material	Shape		Node	Cover	Invert	Size	Material	Shape		Node	Cover	Invert	Size	Material	Shape
0550X	4.15		225	VC	CIRC																				
1501X	2.89	1.1	225	VC	CIRC																				
1401X	2.71	1.24	225	VC	CIRC																				
1402X	2.73	1.09	225	VC	CIRC																				
1403X	2.89	0.82	300	VC	CIRC																				
1404X	2.74	0.93	225	VC	CIRC																				
1405X	2.89	1.14	225	VC	CIRC																				
1450X	2.7	1.5	900	CP	CIRC																				
1501X	4.27	3.34	150	VC	CIRC																				
1502X	4.59	2.92	225	VC	CIRC																				
1503X	4.24		225	VC	CIRC																				
1504X	4.71		225	VC	CIRC																				
1505X			UNK	UNK	CIRC																				
1510X			UNK	UNK	CIRC																				
1520X			UNK	UNK	CIRC																				
1530X			225	VC	CIRC																				
1550X	4.42	3.41	225	VC	CIRC																				
1602X			UNK	UNK	UNK																				
2401X	3.55		225	VC	CIRC																				
2402X	3.56	1.79	300	VC	CIRC																				
2450X	3.57	1.17	OTHER	BRE	RECT																				
2501X			OTHER	UNK	UNK																				
2502X			OTHER	UNK	UNK																				
2503X			OTHER	UNK	UNK																				
2550X	4.55		225	VC	CIRC																				
2601Y	4.45	2.25	225	VC	CIRC																				
2630X			225	VC	CIRC																				
2651X	4.51	2.55	225	VC	CIRC																				
3402X	3.98	2.34	225	VC	CIRC																				
3417X	4.43	2.46	300	VC	CIRC																				
3450X	4.23	1.13	OTHER	BRE	RECT																				
3451X	3.75	2.39	225	VC	CIRC																				
3501X			OTHER	UNK	UNK																				
3550X			600	CP	CIRC																				
3551X	5.82	1.92	600	CP	CIRC																				
3601X	4.79	1.87	225	VC	CIRC																				
3651X	4.76	2.17	600	CP	CIRC																				
4502X	2.67	-0.41	OTHER	BRE	EGG																				
4401X	5.04	3.23	225	VC	CIRC	•																			
4401Y	5.04	3.28	225	VC	CIRC	•																			
4402X	5.01	3.08	300	VC	CIRC																				
4403X	3.66	2.05	150	VC	CIRC																				
4405X			150	VC	CIRC																				
4406X			225	VC	CIRC																				
4450X	5.04	1.07	OTHER	BRE	RECT																				
4460X			OTHER	BRE	RECT																				
5350X	2.27	0.87	900	CP	CIRC																				
5401X	3.01	1.46	150	VC	CIRC																				
5402X	2.75	1.11	225	VC	CIRC																				
5450X	3.35	2.21	225	VC	CIRC																				
5451X	3	1.99	225	VC	CIRC																				
5551X	5.02	1.04	OTHER	BRE	RECT																				



Date:	19/05/2010
Title:	100789 37-39 Chesswood Road
Drawn by:	goswama

Southern Water

	N	SouthernWater
The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd. accept no responsibility in the event of inaccuracy. The actual positions of pipes should be determined on site.		
Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 598230.		
Drawn by: gosmsmith	Date: 19/02/2010	TITLE: 100189 37-39 Chesswood Road
	Scale: 1:1250	
		O.S.Ref: TQ1203SW

LEGEND - MAINS

- Distribution Main \ Communication pipe
- Trunk Main
- Raw water main
- Non potable
- Abandoned main
- Proposed Main
- Fire main
- Non SWS
- Sluice valve
- Closed valve
- Air valve
- Butterfly valve
- Pressure vacuum valve
- Hydraulic valve
- Motorised valve

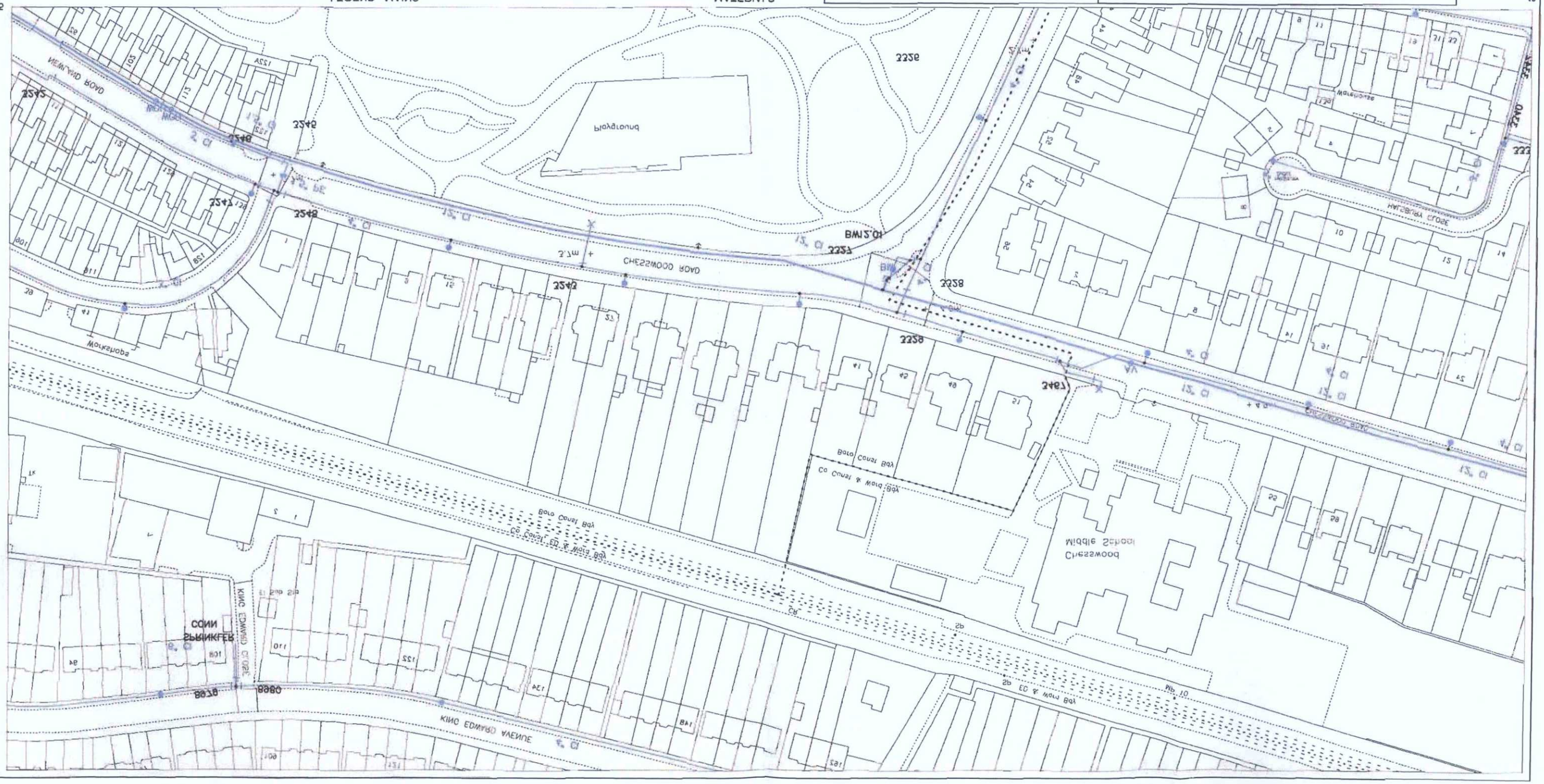
- Clockwise closing valve
- Fire Hydrant
- Washout
- Washout hydrant
- Water
- Capped end
- Emptying bung
- Stopcock
- Leak Noise Correlator Survey Point
- Anode
- Telemetry cable
- Access point \ Manhole

MATERIALS

- AK Alkathene
- BAC Bonded Aggregate Cement
- BFT Brass pressure tank
- BP Booster station
- CI Cast iron
- CO Concrete
- CP Pumping station
- DI Ductile iron
- DS Customer site
- GI Galvanised iron
- GRE Glass reinforced epoxy
- GRP Glass reinforced plastic
- HPE High performance polyethylene
- MAINS Steel
- PE Polyethylene
- PVC (Unplasticised) Polyvinyl chloride
- ST Water tower
- SW Service reservoir
- WT Water Supply Works
- WW Bore hole \ Well
- CSP Concrete segmental lined
- CSU Concrete segmental unlined
- DI Ductile iron
- DS Customer site
- FP Change node
- GI Galvanised iron
- HPE High performance polyethylene
- PSC Concrete pre-stressed
- UK Unknown

MARKING: UNKNOWN (UNK) material new ductile Bonded Aggregate Cement

MARKING: BAC pipes are constructed of Bonded Aggregate Cement


CHESSWOOD ROAD
KING EDWARD AVENUE
Playground
Chesswood Middle School
Mortimore
Hawthorn Close
Bolo Court
Co Court & Mews
Bolo Court
Co Court ED & Mews
Bolo Court
Co Court ED & Mews
Bolo Court
Co Court & Mews
Bolo Court
Co Court & Mews
Bolo Court
Co Court

APPENDIX B

GEOMETRY

Rectangular soakaway 1		Rectangular soakaway 2	
Width (m)	4	Width (m)	4
Length (m)	16	Length (m)	16
Diameter (m)			
Soakaway base area (m2)	64	Soakaway base area (m2)	64

PARAMETERS

Porosity	0.95	Porosity	0.95
Effective porosity			
Infiltration coefficient (m/h)	0.0074376	Infiltration coefficient (m/h)	0.0074376
Factor of safety	1.5	Factor of safety	1

AREA TO BE DRAINED

Contributing area		Contributing area	
Front excluding flats	400	Front excluding flats	400
Total area (m2)	400	Total area (m2)	400

DESIGN RAINFALL

M5-60 rainfall depth (mm)	20	M5-60 rainfall depth (mm)	20
Rainfall ratio r	0.4	Rainfall ratio r	0.4
Climate change factor	1.1	Climate change factor	1.1
FEH factor	1	FEH factor	1
Return period (years)	10	Return period (years)	100

Rainfall Duration (h)	Intensity (mm/h)	Rainfall Duration (h)	Intensity (mm/h)
0.083333333	120.78	0.083333333	189.09
0.166666667	84.546	0.166666667	132.363
0.25	69.182	0.25	111.026
0.5	43.866	0.5	70.398
1	27.28	1	44.66
2	16.436	2	26.643
4	9.649	4	15.581
6	7.135	6	11.521
10	4.702	10	7.468
24	2.441	24	3.877

RESULTS

Maximum water depth (m)	0.25	Maximum water depth (m)	0.4
Time for half-emptying (h)	21.45	Time for half-emptying (h)	21.53

GEOMETRY

Rectangular soakaway 1		Rectangular soakaway 2	
Width (m)	10	Width (m)	10
Length (m)	12	Length (m)	12
Diameter (m)			
Soakaway base area (m2)	120	Soakaway base area (m2)	120

PARAMETERS

Porosity	0.95	Porosity	0.95
Effective porosity			
Infiltration coefficient (m/h)	0.0074376	Infiltration coefficient (m/h)	0.0074376
Factor of safety	1.5	Factor of safety	1

AREA TO BE DRAINED

Contributing area		Contributing area	
Rear area	719	Rear area	719
Total area (m2)	719	Total area (m2)	719

DESIGN RAINFALL

M5-60 rainfall depth (mm)	20	M5-60 rainfall depth (mm)	20
Rainfall ratio r	0.4	Rainfall ratio r	0.4
Climate change factor	1.1	Climate change factor	1.1
FEH factor	1	FEH factor	1
Return period (years)	10	Return period (years)	100

Rainfall Duration (h)	Intensity (mm/h)	Rainfall Duration (h)	Intensity (mm/h)
0.083333333	120.78	0.083333333	189.09
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4	9.649	4	15.581
6	7.135	6	11.521
10	4.702	10	7.468
24	2.441	24	3.877

RESULTS

Maximum water depth (m)	0.24	Maximum water depth (m)	0.39
Time for half-emptying (h)	21.57	Time for half-emptying (h)	22.5